

IN THE CLAIMS

Please cancel claims 20-22 without prejudice or disclaimer as to their subject matter, amend claims 1, 15, 26, 29 and 32, and newly add claim 35 by this amendment as follows:

1 1. (Amended) An ink-jet printhead, comprising:

2 a substrate being a single integrated monolithic and homogenous unit of silicon, said
3 substrate, having a rear surface, said rear surface having a channel having a predetermined depth,
4 wherein a plurality of ink feed holes are formed on a bottom of the channel perforating said
5 substrate;

6 a nozzle plate coupled to a front surface of the substrate, said nozzle plate being
7 perforated by a plurality of chamber-orifice complex holes, wherein each chamber-orifice
8 complex hole corresponds to at least one of said plurality ink feed holes; and

9 a plurality of heaters disposed on the front surface of the substrate, each one of said
10 plurality of heaters being located near corresponding ones of said plurality of chamber-orifice
11 complex holes.

1 15. (Amended) An ink-jet printhead, comprising:

2 a substrate having a front side and a back side opposite to said front side, wherein said
3 back side comprises a channel along an entire length of said substrate, said channel having a
4 bottom wherein a plurality of holes perforate through to said front side of said substrate;

5 a plurality of heaters, each electrically connected to a pair of signal lines, disposed on said

6 front side of said substrate, each one of said plurality of heaters being located near at least one of
7 said plurality of holes in said substrate; and

8 a nozzle plate perforated by a plurality of nozzle holes, said nozzle plate having a bottom
9 side attached to said front side of said substrate so that each one of said plurality of nozzle holes
10 exposes corresponding ones of said plurality of heaters and so that each one of said plurality of
11 nozzle holes exposes at least one of said plurality of holes perforating said substrate, each of said
12 plurality of nozzle holes having a conical, frustum-shaped section and a cylindrical section, said
13 frustum-shaped section being at a top side of said nozzle plate and said cylindrical section being
14 near said bottom side of said nozzle plate, each of said plurality of nozzle holes having a first
15 diameter at said top side of said substrate and a second and larger diameter on said bottom side of
16 said substrate, said frustum-shaped section of each nozzle hole joining with said cylindrical
17 section of each nozzle hole at a location between said top side and said bottom side of said
18 nozzle plate and at a point where a diameter of said nozzle plate is equal to said second diameter.

1 26. (Amended) The ink-jet printhead of claim 1, said ink-jet printhead being
2 manufactured by a process geared for mass production, said process comprising the steps of:

3 etching said channel into a rear surface of said substrate;

4 etching a plurality of holes through to said front surface of said substrate to perforate said
5 substrate;

6 depositing a first plurality of signal lines and a second plurality of signal lines on said
7 front surface of said substrate, each one of said first plurality of signal lines terminating near

8 termination points of corresponding ones of said second plurality of signal lines, each of said
9 terminating portions of said first and said second signal lines terminating near at least one of said
10 plurality of holes perforating said front surface of said substrate;

11 depositing said heaters made of a resistive material onto said front surface of said
12 substrate so as to said connect terminating ends of each one of said first plurality of signal lines
13 with corresponding terminating ends of said second plurality of signal lines, said resistive
14 material being near to at least one of said plurality of holes perforating said front surface of said
15 substrate; and

16 attaching said nozzle plate perforated by said plurality of nozzle holes onto said front
17 surface of said substrate so that each one of said plurality of nozzle holes is aligned to
18 corresponding ones of terminating ends of said first and said second signal lines, said resistive
19 material, and at least one of said plurality of holes perforating said front surface of said substrate.

1 29. (Amended) The ink-jet printhead of claim 17, said ink-jet printhead being
2 manufactured by a process geared for mass production, said process comprising the steps of:

3 etching said channel into said back side of said substrate;

4 etching said substrate to produce said plurality of holes that perforate said front side of
5 said substrate;

6 depositing a first plurality of signal lines and a second plurality of signal lines on said
7 front surface of said substrate, each one of said first plurality of signal lines terminating near
8 termination points of corresponding ones of said second plurality of signal lines, each of said

9 terminating portions of said first and said second signal lines terminating near at least one of said
10 plurality of holes perforating said front side of said substrate;

11 depositing said plurality of heaters made of a resistive material onto said front surface of
12 said substrate so as to said connect terminating ends of each one of said first plurality of signal
13 lines with corresponding terminating ends of said second plurality of signal lines, said resistive
14 material being near to at least one of said plurality of holes perforating said front side of said
15 substrate; and

16 attaching said nozzle plate perforated by said plurality of nozzle holes onto said front side
17 of said substrate so that each one of said plurality of nozzle holes are aligned to corresponding
18 ones of terminating ends of said first and said second signal lines, said resistive material, and at
19 least one of said plurality of holes perforating said front side of said substrate.

1 32. (Amended) The ink-jet printhead of claim 19, said ink-jet printhead being
2 manufactured by a process geared for mass production, said process comprising the steps of:

3 etching said channel into said back side of said substrate;

4 etching said substrate to produce said plurality of holes that perforate said front side of
5 said substrate;

6 depositing a first plurality of signal lines and a second plurality of signal lines on said
7 front surface of said substrate, each one of said first plurality of signal lines terminating near
8 termination points of corresponding ones of said second plurality of signal lines, each of said
9 terminating portions of said first and said second signal lines terminating near at least one of said

10 plurality of holes perforating said front side of said substrate;
11 depositing said plurality of heaters made of a resistive material onto said front surface of
12 said substrate so as to said connect terminating ends of each one of said first plurality of signal
13 lines with corresponding terminating ends of said second plurality of signal lines, said resistive
14 material being near to at least one of said plurality of holes perforating said front side of said
15 substrate; and
16 attaching said bottom side of said nozzle plate perforated by said plurality of nozzle holes
17 onto said front side of said substrate so that each one of said plurality of nozzle holes are aligned
18 to corresponding ones of terminating ends of said first and said second signal lines, said resistive
19 material, and at least one of said plurality of holes perforating said front side of said substrate.

B7 1 --35. The ink-jet printhead of claim 15, said substrate being a single homogenous
2 integrated monolithic unit of silicon.--
